THE INVENTION CLAIMED IS

1. A stretchable electronic apparatus, the apparatus having a central longitudinal axis and the apparatus being stretchable in a longitudinal direction generally aligned with the central longitudinal axis, comprising:

a stretchable polymer body, and

at least one circuit line operatively connected to said stretchable polymer body, said at least one circuit line extending in the longitudinal direction and having

a longitudinal component that extends in the longitudinal direction and having

an offset component that is at an angle to the longitudinal direction,

said longitudinal component and said offset component allowing the apparatus to stretch in the longitudinal direction while maintaining the integrity of said at least one circuit line.

2. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line is S-shaped.

3. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line is sawtooth shaped.

4. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line is sawtooth shaped with the sawtooth having adjacent segments and said adjacent segments are at an angle of 45° to each other.

5. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line is sawtooth shaped with the sawtooth having rounded corners.

6. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line is in the form of an S-shaped channel.

7. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line is in the form of a serpentine channel.

8. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line is in the form of a sawtooth

9. The stretchable electronic apparatus of claim 1 wherein said stretchable polymer body is silicone.

10. The stretchable electronic apparatus of claim 1 wherein said stretchable polymer body comprises poly(dimethylsiloxane).

11. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line comprises conductive ink.

12. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line comprises a conductive wire.

13. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line comprises a conductive micron-scale wire.

14. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line comprises a conductive metal paste.

15. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line comprises a photolytic metal material.

16. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line comprises a conductive polymer.

17. The stretchable electronic apparatus of claim 1 wherein said at least one circuit line comprises a fluidic circuit line.

18. The stretchable electronic apparatus of claim 1 wherein said stretchable polymer body comprises a microcable.

19. The stretchable electronic apparatus of claim 1 wherein said stretchable polymer body comprises an electronic device.

20. A stretchable electronic circuit, the circuit having a central longitudinal axis, comprising:

a flexible polymer substrate, and

at least one circuit line operatively connected to said flexible polymer substrate, said at least one circuit line having

a component that is aligned with the central longitudinal axis of the circuit and

a component that is at an angle to the central longitudinal axis of the circuit.

21. The stretchable electronic circuit of claim 20 wherein said at least one circuit line is S-shaped.

22. The stretchable electronic circuit of claim 20 wherein said at least one circuit line is sawtooth shaped.

23. The stretchable electronic circuit of claim 20 wherein said at least one circuit line is sawtooth shaped with the sawtooth having adjacent segments and said adjacent segments are at an angle of 45° to each other.

24. The stretchable electronic circuit of claim 20 wherein said at least one circuit line is sawtooth shaped with the sawtooth having rounded corners.

25. The stretchable electronic circuit of claim 20 wherein said at least one circuit line is in the form of an S-shaped channel.

26. The stretchable electronic circuit of claim 20 wherein said at least one circuit line is in the form of a serpentine channel.

27. The stretchable electronic circuit of claim 20 wherein said at least one circuit line is in the form of a sawtooth

28. The stretchable electronic circuit of claim 20 wherein said flexible polymer substrate is silicone.

29. The stretchable electronic circuit of claim 20 wherein said flexible polymer substrate comprises poly(dimethylsiloxane).

30. The stretchable electronic circuit of claim 20 wherein said at least one circuit line comprises conductive ink.

31. The stretchable electronic circuit of claim 20 wherein said at least one circuit line comprises a conductive wire.

32. The stretchable electronic circuit of claim 20 wherein said at least one circuit line comprises a conductive micron-scale wire.

33. The stretchable electronic circuit of claim 20 wherein said at least one circuit line comprises a conductive polymer.

34. The stretchable electronic circuit of claim 20 wherein said at least one circuit line comprises a fluidic circuit line.

35. A method of producing a stretchable electronic device having a central longitudinal axis and being stretchable in a longitudinal direction generally aligned with the central longitudinal axis, comprising the steps of:

providing a stretchable polymer body;

applying to said stretchable polymer body, a circuit line longitudinal component that extends in the longitudinal direction, and

applying to said stretchable polymer body, a circuit line offset component that is at an angle to the longitudinal direction,

said longitudinal component and said offset component allowing the apparatus to stretch in the longitudinal direction while maintaining the integrity of said circuit line longitudinal component and said circuit line offset component.

36. The method of claim 35 wherein said stretchable polymer body is silicone.

37. The method of claim 35 wherein said stretchable polymer body comprises poly(dimethylsiloxane).

38. The method of claim 35 wherein said steps of applying to said stretchable polymer body a circuit line longitudinal component that extends in the longitudinal direction and applying to said stretchable polymer body a circuit line offset component that is at an angle to the longitudinal direction, comprises producing three-dimensional microfluidic channels in said stretchable polymer body.

39. The method of claim 38 including the step of filling said three-dimensional microfluidic channels with a conductive material.

40. The method of claim 38 including the step of filling said three-dimensional microfluidic channels with a conductive metal.

41. The method of claim 38 including the step of filling said three-dimensional microfluidic channels with a conductive polymer.

42. The method of claim 38 including the step of filling said three-dimensional microfluidic channels with a fluid to form a fluidic circuit.

43. The method of claim 38 including the step of filling said three-dimensional microfluidic channels with conductive ink.

44. The method of claim 43 including the step of curing said conductive ink to produce embedded conducting networks within said stretchable polymer body.

45. The method of claim 44 wherein said step of filling said three-dimensional microfluidic channels with said conductive ink comprises injecting said conductive ink into said three-dimensional microfluidic channels.

46. The method of claim 45 wherein said step of filling said three-dimensional microfluidic channels with said conductive ink comprises injecting

said conductive ink into said three-dimensional microfluidic channels using a syringe.

47. The method of claim 45 wherein said steps of filling said three-dimensional microfluidic channels with said conductive ink comprises using a vacuum to draw said conductive ink through said three-dimensional microfluidic channels.

48. The method of claim 35 wherein said steps of applying to said stretchable polymer body a circuit line longitudinal component that extends in the longitudinal direction and applying to said stretchable polymer body a circuit line offset component that is at an angle to the longitudinal direction, comprises using a stamp to place said conductive ink in a desired pattern on said stretchable polymer body.

49. The method of claim 35 wherein steps of applying to said stretchable polymer body a circuit line longitudinal component that extends in the longitudinal direction and applying to said stretchable polymer body a circuit line offset component that is at an angle to the longitudinal direction, comprises uses photolithography.

50. The method of claim 35 wherein said stretchable polymer body is a micro cable.

51. The method of claim 35 wherein said stretchable polymer body is an electronic device.